

What is claimed is:

1 1. A semiconductor light emitting element that is made
2 by using the lateral growth function of semiconductor crystal
3 while providing an ELO mask on a crystal growth surface of a
4 crystal growth substrate, wherein at least part of a sidewall
5 of the ELO mask is provided with an inclined plane that is
6 inclined to the crystal growth surface such that the
7 semiconductor crystal to be formed on the ELO mask substantially
8 has no void.

1 2. The semiconductor light emitting element according to
2 claim 1, wherein:

3 at least part of the inclined plane is curved.

1 3. The semiconductor light emitting element according to
2 claim 2, wherein:

3 the shape of ELO mask in cross section vertical to the
4 crystal growth surface is formed nearly semicircular, nearly
5 semi-elliptic or partially either of these shapes.

1 4. The semiconductor light emitting element according to
2 claim 1, wherein:

3 the shape of ELO mask in cross section vertical to the
4 crystal growth surface is formed nearly isosceles triangular
5 or nearly isosceles trapezoidal with flat top.

1 5. The semiconductor light emitting element according to
2 claim 1, wherein:

3 the shape of ELO mask on the crystal growth surface is
4 formed like a spot or a nearly stripe.

1 6. The semiconductor light emitting element according to
2 claim 1, wherein:

3 the crystal growth substrate is of sapphire.

1 7. The semiconductor light emitting element according to
2 claim 1, wherein:

3 the semiconductor crystal is of $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ($0 \leq x \leq 1$).

1 8. The semiconductor light emitting element according to
2 claim 1, wherein:

3 the semiconductor light emitting element is a flip-chip
4 type LED, the refractive index of the ELO mask is set to be
5 greater than that of the crystal growth substrate and smaller
6 than that of the semiconductor crystal.

1 9. A method of making a semiconductor light emitting
2 element, comprising the steps of:

3 forming an ELO mask on a crystal growth surface of a
4 crystal growth substrate;

5 providing at least part of a sidewall of the ELO mask with
6 an inclined plane that is inclined to the crystal growth
7 surface; and

8 growing semiconductor crystal on the crystal growth
9 surface of the crystal growth substrate.

1 10. The method according to claim 9, wherein:

2 at least part of the inclined plane is curved.

1 11. The method according to claim 10, wherein:
2 the shape of ELO mask in cross section vertical to the
3 crystal growth surface is formed nearly semicircular, nearly
4 semi-elliptic or partially either of these shapes.

1 12. The method according to claim 9, wherein:
2 the shape of ELO mask in cross section vertical to the
3 crystal growth surface is formed nearly isosceles triangular
4 or nearly isosceles trapezoidal with flat top.

1 13. The method according to claim 9, wherein:
2 the shape of ELO mask on the crystal growth surface is
3 formed like a spot or a nearly stripe.

1 14. The method according to claim 9, wherein:
2 the crystal growth substrate is of sapphire.

1 15. The method according to claim 9, wherein:
2 the semiconductor crystal is of $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ($0 \leq x \leq 1$).

1 16. The method according to claim 15, wherein:
2 the amount of trimethylgallium ($\text{Ga}(\text{CH}_3)_3$) to be supplied
3 per unit time in growing the semiconductor crystal is 100μ
4 mol/min. or more and $800 \mu\text{mol/min.}$ or less.